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Failed Implementation of Operational Design into the Marine Corps Planning Process and the
Need for Systems Architecting

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF MILITARY STUDIES.

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PREFACE AND ACKNOWLEDGEMENTS

The impetus for this paper came from the author's experience attempting to utilize the latest version of the Marine Corps Planning Process (MCP) during planning exercises at the United States Marine Corps Command and Staff College. The implementation of operational design into the first step of the process proved very cumbersome and difficult for the students and staff to grasp. The author, with a limited background in Systems Engineering, believed that an integration of the principles from the discipline of Systems Architecting into the MCP would create a process that is more intuitive and user friendly.

The author would like to acknowledge Dr. Richard DiNardo and Lieutenant General Paul K. Van Riper, USMC (ret.) for their assistance and time. The author would also like to acknowledge the patience and support of his wife and children as he completed this work.

EXECUTIVE SUMMARY

Title: Failed Implementation of Operational Design into the Marine Corps Planning Process and the Need for Systems Architecting

Thesis: This paper will attempt to answer the question of whether the fundamentals of systems architecture are beneficial to a better understanding of the elements and goals of operational design as understood throughout the Department of Defense and provide a sound basis for its inclusion in the MCPP.

Discussion: On 24 August 2010, The United States Marine Corps published an update to Marine Corps Warfighting Publication (MCWP) 5-1, Marine Corps Planning Process (MCPP). This publication replaced and superseded the original MCWP 5-1, published on 5 January 2000 and was an attempt to incorporate operational design into the first step of MCPP. The major change renamed the first step to problem framing, attempting to emphasize a greater awareness and understanding of the background and environment in which a military operation would occur. This paper will first outline the fundamental USMC doctrine related to the development of the MCPP, describe the changes and emphasis to the MCPP from January 2000 to August 2010, evaluate the current MCPP in light of literature published on operational design and finally compare and contrast the MCPP and operational design to the civilian discipline of systems architecting. The author argues that the discipline of systems architecture will offer a gateway to a better understanding of operational design and possible foundation for its incorporation into the MCPP.

Conclusion: The latest version of the MCPP and most joint doctrine fails to integrate operational design with its General Theory of Systems foundation correctly. Two joint publications provide a well-grounded starting point for an understanding of operational design but do not offer the warfighter a common model that integrates operational design into modern military organizations. The discipline of systems architecting however offers a common vernacular and model as a foundation for further experimentation and study of correctly utilizing operational design by USMC planning theory and doctrine.

Introduction

On August 24, 2010, The United States Marine Corps published a revision and update to Marine Corps Warfighting Publication (MCWP) 5-1, Marine Corps Planning Process (MCP). This publication replaced and superseded the original MCWP 5-1, published on 5 January 2000. According to the foreword signed by Lieutenant General George J. Flynn, Deputy Commandant for Combat Development and Integration, the new MCWP 5-1 includes an enhanced discussion of common terms found in the older document, a clarification between commander's intent and guidance, the introduction of the term design to the MCP and an attempt to incorporate design elements into the MCP.¹ By far the most significant change contained in the new edition of MCWP 5-1 and the focus of this paper, is the incorporation of the term design and an attempt to update the MCP to reflect elements of operational design.

The revised MCP attempts primarily to incorporate characteristics and ideas from operational design into the first step. The Marine Corps changed the name of the first step from mission analysis to problem framing and added a more thorough emphasis on an understanding of the background and environment in which a military operation would occur.² However, during planning exercises conducted at USMC Command and Staff College, this change caused much confusion and inhibited the planning process. The majority of the class concluded that design was important but poorly integrated and required further study. Therefore, this paper will first outline the fundamental USMC doctrine related to the development of the MCP, describe the changes and emphasis to the MCP from January 2000 to August 2010, evaluate the current MCP in light of literature published on operational design and finally compare and contrast the MCP and operational design to the civilian discipline of systems architecting. The author believes the discipline of systems architecture offers a gateway to a better understanding of

operational design and possible foundation for its incorporation into the MCPP. Fundamentally, this paper will attempt to answer the question of whether the fundamentals of systems architecture are beneficial to a better understanding of the elements and goals of operational design as understood throughout the Department of Defense and provide a sound basis for its inclusion in the MCPP.

Section 1: Fundamental USMC Planning Theory and Doctrine

On 21 July 1997, the United States Marine Corps published Marine Corps Doctrinal Publication (MCDP) 5, Planning. This publication was one of nine that espoused the Marine Corps' warfighting doctrine.³ The foreword of MCDP 5 explains that the "publication describes the theory and philosophy of military planning as practiced by the U.S. Marine Corps."⁴ MCDP 5 describes the baseline theory of planning, endorsed by the USMC. The publication does not provide a specific process or steps but simply details the doctrinal underpinnings that will guide future development of doctrine, training and education.⁵

Prior to conducting an analysis of the MCPP, both past and present, a short discussion of MCDP 5 is necessary. This discussion will provide a common lens on which to further investigate how the USMC visualizes, conducts and executes planning, primarily how the USMC understands its operational environment and problems. The author will argue that MCDP 5 focuses on planning as a process that produces orders and directives, that the creative and intuitive dynamics of planning supposedly is the sole responsibility of the commander, and that the purpose of the staff is to provide the details and qualitative analysis that drive the planning process and orders publication.

First, MCDP-5 clearly articulates its focus in the foreword, "the focus here is on operational planning, especially at the tactical level."⁶ Planning that focuses on the tactical level

by virtue must focus on the end product, execution. To be successful at the tactical level, a unit must understand its mission and commander's intent. This necessitates planning focused on action and orders. The majority of MCDP-5 continually focuses on the product of the planning processing, the plan itself, by describing the theory and characteristics of a good plan.

Secondly, MCDP-5 discusses the activity of analysis and synthesis. Analysis corresponds to the science of war, focusing facts and systemic study. Synthesis expresses the art of war, the creative and insightful impetus to understanding a problem and foreseeing a resolution.⁷ Throughout MCDP-5, the publication primarily confines synthesis to the commander alone. The staff may function as a proverbial sounding boarding but synthesis resides with the commander. Analysis is a staff function. The scientific activities required to support the different functions are solely the responsibility of the staff. MCDP 5 continues to describe the three levels of planning, conceptual, functional and detailed.

Conceptual planning corresponds with the art of war and the mental activity of synthesis. This level of planning requires creative thought and insight and responsibility thus resides in the commander. The functional level of planning directs discrete functional actions decomposed into warfighting functions or possibly lines of operations, combining both the art and science of war. Detailed planning describes the specifics required for action, the science of war. This level collects and arranges the facts, figures and information required to achieve the desired objectives assigned by functional planning. The staff functions as the primary functional and detailed planners as appropriate.⁸ Finally, the conclusion MCDP-5 continues to emphasis the role of the commander in planning. "The commander is the single most important factor in effective planning"⁹ This is especially true according to MCDP-5 not only because the commander is the

key decision maker because also because the conceptual planning or art of war is his domain alone.

Section 2: Mission Analysis

In summary, MCDP-5 forces the planning staff to focus on the product and relegates all conceptual planning to the commander. Therefore, these characteristics drive the development of the MCPP as articulated in MCWP 5-1 published on 5 January 2000. In the introduction of MCWP 5-1, the reader is told that the MCPP “recognizes the commander’s role as the decision maker” and “focuses on the mission and threat”.¹⁰ The thrust of the MCPP is top down planning, single-battle concept and integrated planning and it consists of six steps: Mission Analysis, Course of Action (COA) Development, COA War Game, COA Comparison and Decision, Orders Development and Transition.¹¹ The MCPP is an example of classical, analytical model of decision making where as the process identifies the problem, produces one or more solutions and pursues an optimal solution by comparison.¹²

The classical model assumes rational problems and solutions, focusing on producing the optimal solution. A cursory read of the introduction of MCWP 5-1 and the steps described reveal the publication and process is true to the doctrinal underpinnings espoused in MCDP 5 and the classical model. The MCPP consists of a total of six steps with five steps involved in product development. Therefore, the preponderance of activity is associated directly with producing a solution and publishing orders. The introduction also continues the theme of the conceptual centrality of the commander in the process. By conceptual centrality, the author is not supposing a commander should not be involved.

The author, however, does suggest that MCDP-5 by limiting creative activity to the commander, limits the solution space and understanding of the problem. MCPP, with MCDP 5

as a foundation, reflects this trend. A detailed analysis of the MCPP in its entirety is beyond the scope of this paper. However, the author will discuss the impact of a product focused and commander centric planning theory on first step of the MCWP 5-1 as published on January 5, 2000 and then revised in August 24, 2010.

The first step to the MCPP according to the document published 5 January 2000 was Mission Analysis. A newly formed Operational Planning Team (OPT), usually in response to tasking from higher headquarters, would meet, open up MCWP 5-1 and begin planning. The purpose of this step according to the introduction of MCWP 5-1 was "to review and analyze orders, guidance and other information provided by higher headquarters and to produce a unit mission statement."¹³ By reading the introduction alone, the OPT is aware that a product is required from this first step, namely the Mission Statement. Once the OPT was aware of the purpose of the Mission Analysis step, the first action would normally consist of collecting the inputs required according to the process. Figure 1 in Appendix A depicts the inputs, process and outputs for the Mission Analysis step. Those inputs normally expected would be the Commander's Orientation, Higher Headquarters Warning Order, Restraints and/or Constraints, and Higher Headquarters intelligence and Intelligence Preparation of the Battlespace (IPB) products.

The Commander's Orientation would consist of the Commanders Battlespace Area Evaluation (CBAE) and initial guidance. MCWP 5-1 suggests that the CBAE include preliminary identification of the Center of Gravity Analysis, Commanders Intent and Commanders Critical Information Requirements (CCIR) and should be based on his understanding of mission, battlespace and enemy."¹⁴ The Higher Headquarters Warning Order could possibly be formal order or verbal guidance. The OPT would make every effort to gather

all known and relevant information from the senior headquarters staff prior to commencing mission analysis. In addition, restraints, things the commander cannot do, and constraints, the thing a commander must do, would be gathered and analyzed.¹⁵ Finally, the team reviews the higher headquarters intelligence information and IPB. Normally, the commander's intelligence section would also begin constructing their IPB and at this stage would normally consist of at a minimum of a Modified Combined Obstacle Overlay, Enemy Doctrinal Template and Situation Template.¹⁶

These products are oriented on the physical environment, enemy's method of fighting and respective positions of friendly and enemy conventional forces respectively. After gathering and reviewing all the inputs the OPT has their commander's thoughts on the problem and solution, higher headquarters guidance and thoughts on the problem and solution and the intelligence section's thoughts on the problem and solution. Therefore before any original work or thought begins by the OPT; three different entities have possibly expressed their opinion on the military problem and a possible solution. The OPT's solution space is defined even before the team begins its work.

Once the inputs were gathered, the OPT would now begin the process portion of the Mission Analysis step as depicted in Figure 1, Appendix A. The focus of this portion of step one is the development of the Mission Statement and collection of other information needed to continue the process. The OPT composes a proposed mission statement after thorough search for and understanding of all specific, implied and essential tasks. Specific tasks are those tasks that higher headquarters assigns to a unit, implied tasks are those task not directly assigned but support specific tasks and essential tasks are those tasks that support the commander's intent or purpose directly. The mission statement must incorporate the essential tasks. Once the tasks are

understood and a mission statement drafted, the OPT would continue to refine the IPB, COG analysis, battlespace estimate, available assets and shortfalls, restraints and constraints, CCIRs and request or develop staff estimates that provide quantitative information required for planning. Finally, the team attempts to understand any assumptions made either purposefully or inadvertently and lists and submits Request for Information (RFIs). Once these activities are completed, the team presents to the commander a Mission Analysis Brief. The commander approves and the team moves to step 2 or returns to Mission Analysis and improves the products.

However, what did the OPT actually produce? In essence, the team analyzed orders given, their commander's mental model and disposition of the problem and situation and an estimate of intelligence to develop a mission statement that would direct action for subordinate units. The team also updated and critiqued work originally created by the commander, other sections within the command and higher headquarters. According to the process, the team was not required to consider the situation, problem or environment. The team relied on the efforts of others, particularly the commander and simply added depth in a scientific fashion. Before the process, the commander practically mapped out the situation and possible solution prior to the process beginning. It is evident that he alone commenced and practically completed the conceptual planning. The team simply validated and added scientific, factual depth to his initial mental model. The commander practiced the art of war through formulation of the CBAE and the staff applied the science.

Section 3: Problem Framing

On August 24, 2010, the USMC published a revision of MCWP 5-1. This revision attempted to introduce the Department of Defense (DOD) concept of Operational Design and incorporate those ideas into the process. Joint Publication (JP) 1-02 defines operational design

as “the conception and construction of the framework that underpins a campaign or major operation plan and its subsequent execution.” JP 3-0 Joint Operations and JP 5-0 Joint Operational Planning explain in detail the DOD’s concept of Operational Design and its implementation into the planning process. This paper will incorporate a discussion of the DOD’s concept of Operational Design in light of the changes to Marine Corps doctrine and other military literature in the following section. This section however will focus on the changes in the latest edition of MCWP 5-1 regarding Operational Design that reside in the introduction and the first step of the process, renamed Problem Framing. The remaining five steps in the MCPP are almost identical in content and structure to the original process.

The introductory chapter of the current MCWP 5-1 describes “understanding of the problem-the difference between existing and desired conditions-and to devise a way to solve it” as the essential function of planning.¹⁷ This chapter continues to summarize the ideas contained in MCDP 5 concerning conceptual, functional and detailing planning and introduces the idea of design, defining it as “the conception and articulation of a framework for solving a problem.”¹⁸ “The purpose of design is to achieve a greater understanding of the environment and the nature of the problem in order to identify an appropriate conceptual solution”¹⁹ Design, therefore, is the application of conceptual planning from the beginning to the end in order to establish a visualization of the environment, problem, solution and desired end results.

The Joint Warfighting Center (JWFC) Doctrine Pamphlet 10 lists design components as frame the environment, frame the problem, develop the operational approach, document the results and reframe as required.²⁰ The bulk of the activity in design focuses on conceptualizing and refining a mental model to describe the environment and the problem. The concept of design promotes the idea that the application of US power must solve the correct problem in an

environment the US government understands. The Introduction to Design section in chapter one correctly describes the concept of design but the implementation is limited to the first step.

The injects, activities and results of Problem Framing are graphically depicted in Figure 2, Appendix A. The injects include many items from Mission Analysis to include situational information and products from higher headquarters but adds outside information, commander and staff expertise, experience, judgment and knowledge and a confirmation brief. The Commander's Orientation from Mission Analysis is noticeably absent from the list of injects and outside activity and staff expertise are noteworthy additions. Just from a comparison of the injects to the first step, it is obvious the new edition of the MCPP attempts to formally include the staff in the conceptual planning of the operation. As described in the previous section, during mission analysis the commander performed the bulk of the conceptual planning prior to commencing the planning process, which resulted in the Commander's Orientation. In Problem Framing, the conceptual planning is now an activity to occur under the design label during the process. The remaining activities during Problem Framing are staff actions, similar to Mission Analysis. Also, from comparison between Figure 1 and Figure 2 in Appendix A, the author concludes the end results of both Mission Analysis and Problem Framing are in essence identical.

In the new MCPP, the development of the commander's orientation is now a product developed during the Problem Framing step with the assistance of the staff. MCWP 5-1 describes the commander's orientation as "the first of many venues where the commander, his staff and subordinate commanders collaborate through the exchange of information and sharing of ideas and perspectives."²¹ This discussion is the first step in the design process that precedes further design dialogue that occurs between the commander, staff and others.²²

The Problem Framing chapter emphasizes that further discussions at this stage should center on understanding the environment and understanding the problem. The document contains two sections within Problem Framing that list possible topics for discussion concerning the environment and the problem. However outside of providing a checklist of items to cover during discussions, the document provides no other guidance. Immediately following the checklist of topics, the document moves forward to discuss the formulation of the commander's initial intent and guidance under the title of Commander's Initial Intent and Guidance. Here, the reader learns that "having engaged in a design dialogue with his planners and staff in order to gain insight into the problem, the commander provides his initial intent and guidance in order to direct continue actions in the planning process."²³ The result is a commander's initial guidance that addresses the environment and nature of the problem.²⁴

The remaining steps are functionally identical to Mission Analysis. After receiving the commander's initial guidance the staff commences the standard staff actions and performs ongoing activities previously discussed in Mission Analysis. Finally, the Problem Framing brief is very similar to a Mission Analysis brief. This brief does not intentionally discuss any of the design dialogue but it may be included in the situation update and/or IPB. The only other mention of a design component is in the last section of the chapter discussing Problem Framing, Commander's Course of Action Guidance. According to the MCPP, after the Problem Framing step the commander should formulate "his commander's concept, a clear and concise expression of what he intends to accomplish and how it will be done using available resources."²⁵ This loosely corresponds to the design component of develop the operational approach. This is the extent of design implementation into the MCPP as the remaining five elements do not address the design concept.

In summary, the new MCPP introduces the concept of design and attempts to implement certain design components into the first step of Problem Framing. In Problem Framing, the MCPP acknowledges the need for group dialogue to assist the commander in the formulation of his initial guidance and intent. This dialogue centers only on the operational environment and problem. From these discussions, the process assumes the commander is now better able to visualize the entire situation and is equipped to give guidance and intent for the remaining process. After this initial dialogue and the commander issues his guidance and intent, the process is functionally identical to the steps first outlined on January 5, 2000. The only fundamental change in the current MCPP is its attempt to involve the staff in the conceptual planning in the beginning of the Problem Framing step. The MCPP continues to be wedded to the classical decision making process described by John F. Schmidt and does little to truly implement design concepts.

The latest revision of the MCPP is more inclusive on the subject of conceptual planning expecting the staff's participation prior to the commander issuing his guidance and intent but largely remains focused on obtaining a solution and publishing orders. After the Problem Framing step, there are no required discussions or products related to operational design. The remainder of this paper through a review of DOD and other literature on operational design will argue that the current MCPP fails to implement design correctly. The paper will suggest that literature from the civilian discipline of systems architecting provides insights into the fundamentals of design and its implementation into a doctrinal process.

Section 4: General Systems Theory

To understand the intent and fundamentals of operational design, it requires a brief history and current definitions. The previous section defined operational design from JP 1-02 as

essentially the commander's mental model of a campaign and its execution. The formulation of that mental model is an extension of the creative process called operational art.²⁶ JP 1-02 defines operational art as "the application of creative imagination by commanders and staffs — supported by their skill, knowledge, and experience — to design strategies, campaigns, and major operations and organize and employ military forces."²⁷

The definitions lead the author to conclude that operational art is the creative impetus that allows the commander to create a mental model (operational design) of an upcoming campaign and its execution. Both activities are rooted in the operational level of war, which "links the strategic and tactical levels. It is the use of tactical results to obtain strategic objectives."²⁸ The existence of the operational level of war is widely recognized throughout military doctrine but possibly not its historical and theoretical underpinnings.

Historically, war consisted of strategy and tactics. However, as the size and area of operations of modern armed forces increased something more was required to coordinate tactical events with strategic direction.²⁹ The earliest recognition of the operational dimension appeared in the Soviet Union in the early 1920s and continued to develop throughout the 1930s culminating in the Deep Operation Theory.³⁰ In 1982, the US Army's FM 100-5 introduced the term operational level, refined it to operational art in 1986 and applied it to the AirLand Battle concept.³¹ Overall, the operational level of war and operational art are relatively new to western military thought. However, the theoretical underpinnings of operational art "conform, in its principles and characteristics, to the universal phenomenon of systems. Thus the operational theory constitutes the military version of the Gestalt philosophy or the theory of general systems."³²

Ludwig von Bertalanffy first presented his understanding of a new science in a series of lectures and essays from 1945 to 1951 describing his Theory of General Systems.³³ JP 1-02 defines a system as a “functionally, physically, and/or behaviorally related group of regularly interacting or interdependent elements; that group of elements forming a unified whole.”³⁴ Bertalanffy in turn describes his theory as “the scientific exploration of “wholes” and “wholeness”.”³⁵ General systems theory is the study of the unified whole made up of interacting and interdependent elements. This is in contrast to classical sciences that attempted to breakdown systems into the most simplified elements and study those elements individually. Classical science based system understanding on the study of a system’s elements. This process however was incomplete at best because it failed to account for the interactions between elements in the system. These unexamined interactions and relationships caused the whole to be different from a simple sum of elements. Hence, Bertalanffy attempt to postulate that systems had to be view holistically and studied from that basic premise. Not only did his theory advocate studying different systems holistically but it also hypothesized that all systems regardless of scientific or social discipline share common general characteristics.³⁶ Bertalanffy believed his theory applied in three broad areas, systems science, systems technology and systems philosophy. Systems science and systems technology definitely apply to military operations however the author believes that the systems philosophy underpins the concepts of operational level of war, operational art and operational design.

The systems philosophy has resulted in a new philosophy of nature.³⁷ This new philosophy includes three aspects, systems ontology, systems epistemology, and values. The online dictionary maintained by Merriam-Websters defines ontology as a branch of metaphysics concerned with the nature and relations of being³⁸ and epistemology as the study of a theory of

the nature and grounds of knowledge especially with reference to its limits and validity.³⁹

Systems ontology is the establishment of a system's boundary and its relations in that bounded system and within its environment. Simply, this aspect of systems philosophy is the establishment and investigation of the real, abstract and social systems under study. Systems epistemology is the application of old and new knowledge in order to understand a system holistically. Finally, systems philosophy deals with values. This accounts for the human element in all systems. Humans express value differently having a profound effect on systems and their study.⁴⁰

If the operational level of war is based on systems theory as proposed by Shimon Naveh or more specifically the systems philosophy, military thinkers should attempt to understand and describe operational systems and its context, apply old and new knowledge in systems study and finally understand how human values effect the operational system. Therefore joint doctrine should apply operational art and design in a manner that attempts to understand military operations from a holistic point of view that is focused on understanding the system and environment, understanding the limits of old knowledge and the application of new knowledge and finally understands the value judgments made by participants.

Section 5: Operational Art and Design in Joint Publications

If one accepts that that the philosophy of the General Theory of Systems is the theoretical underpinnings for activities that occur at the operational level of war, then joint doctrine on operational art and design should include the aspects of this foundational philosophy. Therefore, doctrine must promote a holistic paradigm if it is to utilize operation art to create an operational design. For this study, the author surveyed four joint publications to determine if they truly incorporated the systems philosophy. The author grouped Joint Publication 3-0 *Joint Operations*

dated March 22, 2010 and Joint Publication 5-0 *Joint Operational Planning* dated December 26, 2006 together as well as the *Capstone Concept for Joint Operations* (CCJO) dated January 15, 2009 and Joint Warfighting Center (JWFC) Joint Doctrine Series Pamphlet 10 dated September 20, 2010 together. Similarities in either correctly or incorrectly incorporating systems philosophy defined the grouping. The previous discussion on the systems philosophy outlined three aspects by which the author will evaluate each publication. For review, a correct employment of systems theory should evaluate the system and its context as a unique whole, seek to understand what knowledge old and new is applicable in understanding the system and finally include human based value judgments.

JP 3-0 and JP 5-0 both employ the systems philosophy incorrectly. Neither document attempts to evaluate the system as a unique whole but according to a template presented in Figure 3, Appendix A as PMESII which stands for Political, Military, Economic, Social, Information and Infrastructure. This violates the first principle by forcing the planner to fit the situation into those six categories. The operational situation may encompass more or less but the staff must attempt to force their understanding into this template a creating model that is inaccurate from the beginning.⁴¹ According to JP 3-0 and JP 5-0, this model resides in the IPB, created by the intelligence section. The commander and the planning staff would not participate in this model's creation. Hence the greatest benefit to model creation, a shared understanding through creative discourse is lost on all parties. Secondly, JP 3-0 and JP 5-0 focus on operational design as a tool for COA visualization and creation as shown Figure 4, Appendix A. The systems perspective is outside operational design on the left and the tenants of design focus solely on organizing the desired COA. JP 5-0 even states that "these elements of operational design comprise a tool that is particularly helpful during COA determination. Resulting design

alternatives provide the basis for selecting a COA and developing the detailed CONOPS.”⁴²

Operational design in this context becomes a tool to visualize military operations. There is no application of creative action only a new organization system that fits the situation. If operational design is rooted in a systems philosophy, JP 3-0 and 5-0 failed because these documents do treat each situation uniquely and only seek to better organize action along design tenants.

The second group of documents reviewed was the CCJO and JWFC Doctrine Pamphlet 10. These documents fundamentally applied the systems philosophy correctly. First, CCJO articulates three ideas that encapsulate the systems philosophy perfectly.

- “• Address each situation on its own terms, in its unique political and strategic context, rather than attempting to fit the situation to a preferred template.

- Conduct and integrate a combination of combat, security, engagement, and relief and reconstruction activities according to a concept of operations designed to meet the unique circumstances of that situation.

- Conduct operations subject to a continuous assessment of results in relation to expectations, modifying both the understanding of the situation and subsequent operations accordingly.”⁴³

These three ideas guide the commander to evaluate the system and its context as a unique whole, seek to understand what knowledge old and new are applicable in understanding the system and finally include human based value judgments. From this foundation, JWFC Doctrine Pamphlet 10 expands these ideas, presenting a design framework that supports the three tenants in the CCJO. According to JWFC Doctrine Pamphlet 10, frame the environment, frame the problem, develop the operational approach, document the results and reframe as required are the elements of design. In Figure 5, Appendix A, the pamphlet incorporates those design components into a

coherent circular design methodology. This methodology is in direct contrast to the ideas presented by JP 3-0 and 5-0. Where as JP 3-0 and 5-0 promoted a prescriptive systems viewpoint on the operational environment and operational design as a COA organization tool, JWFC Doctrine Pamphlet 10 utilizes design to link environmental understanding, the system in question and a mechanism for providing value judgments and corrections. Basically, CCJO and Pamphlet 10 lay a solid systems philosophy for the broad concepts of operational design. This however, is where the joint publications stop. The next step is the actual implementation of operational design based on systems philosophy into the thought processes and common vernacular of US military commanders and staff.

Section 6: Systems Architecting

In spite of the amount of literature discussing operational design, current military planning doctrine does not incorporate operational design. John F. Schmidt in his article "A Systemic Concept for Operational Design" states that design is absent and "when it occurs today, it usually occurs implicitly within the mind of an individual, and not as an explicit group activity leveraging the intelligence of the group."⁴⁴ Operational design is not part of the military's institution because there currently is no real understanding of how operational design and planning complement one another and because there is tremendous confusion of roles and responsibilities involved with designing and planning. Therefore, in order to begin experimentation with operational design as a commander and staff activity, joint and USMC doctrine must present a model, integrating operational design into current military organizations and functions. As a baseline for that model, doctrine should investigate the discipline of systems architecting.

The discipline of systems architecting is essentially an extension of the traditional architecting process into new technologically advanced fields in response to a realization that failure or success usually is traceable to the beginnings.⁴⁵ Systems architecting does not attempt to engineer a measurable solution in response to a problem but to understand a situation and then conceptualization a general qualitative response. The foundations of modern systems architecting are “a systems approach, a purpose orientation, a modeling methodology, ultraquality, certification, and insight.”⁴⁶ These foundations directly correlate to what is required for operational design. First, operational design is rooted in the systems approach and philosophy. Second, operational design must clearly have a purpose orientation. The client’s purpose for the project drives a system’s architecture. An OPT designs a campaign in response to a strategic purpose. That purpose does not drive the understanding of the environment or problem but underpins all design activities and focuses the conceptual approach. Systems architecting uses a modeling methodology to represent all facets of the project to all stakeholders.

Operational design to be effective must also prescribe to a modeling methodology. The process must produce representative models that correspond to the design methodology presented in Figure 5, Appendix A. Successful operational design must produce shared understanding that is communicable through models. Thirdly, operational design must strive for ultraquality. From an engineering viewpoint, ultraquality implies a level of defects so small that measurement is not possible.⁴⁷ Obviously military operations are quite different, but operational design should strive to model the situation as accurately as possible and develop a solution that will alter the system significantly in favor of the designers. Operational design will not achieve perfection, but designers must understand the requirement to present accurate models and

solutions that satisfy the situation as much as possible. This is not a new concept. John F. Schmidt discusses complex operational situations as wicked problems that require significant solutions because every attempt matters and alters the system.⁴⁸

Certification in operational design is simply the feedback loop. Do the models produced of the environment, system and planned action accurately reflected the understanding of the commander and staff? Certification should be deliberate and continuous throughout the process. Finally as in systems architecting, operational design requires insight. Insight in this sense is the “ability to structure a complex situation in a way that greatly increases understanding of it, is strongly guided by lessons learned from one’s own or other’s experiences and observations.”⁴⁹ Insight is the art of war, applying old and new knowledge from the history of warfare to the current strategic goal. Operational design therefore is the extension of the architecting paradigm into warfare. Doctrine should embrace the architect language as a means to establish and codify operational design into military activities.

The understanding of roles and responsibilities is the first insight offered by the architecting viewpoint. The major stakeholders in an architecture system are possibly the client, the architect, the builder, artisans, the neighbors, the end user and the financier.⁵⁰ In a military setting, these roles have direct counterparts. The client is obviously the commander. The commander is usually under strategic direction from the national government much in the same manner a client has either financiers or a board as oversight. Next, the architect and builder perform two separate and important functions as two separate operational planning teams. The architecting team is responsible to the commander for understanding and creating. This team produces models that share and increase understanding throughout the organization of the environment, the problem and a conceptual solution. The builder team translates concept into

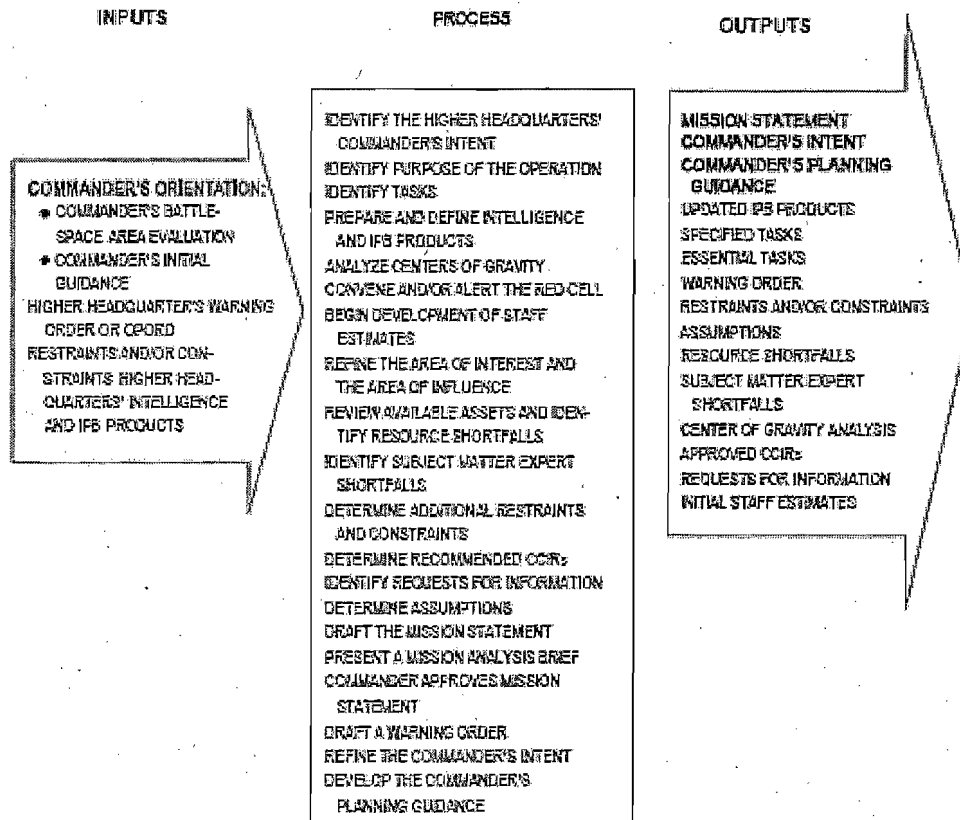
actionable products such as orders. They add depth to the concept, ensure it is grounded in real capability and structure and issue orders. Maneuver units or artisans then act on those orders doing the manual labor of system construction. The end user of a system then interacts with that system daily. The end user does not necessarily make value judgments, but their opinion matters. The end user in a military situation most likely corresponds to the local populace. Their opinion is important and often times are critical to determining operational success. Throughout the process, all entities are in continuous discussion. Often times, artisans correct the architect and builder on what is possible. The client or commander gives continuous certification and feedback as construction or operations continue. An extension of the role and responsibilities of the architecting paradigm offers rich insight into how operational designers interact and fit into our current organizations. An extension of this paradigm, also clearly demonstrates the complementary nature of design and planning. Design precedes planning and creates where as planning adds quantitative depth and ensures design is grounded in reality. Both activities required dedicated time and depending on the campaign, dedicated staffs.

In addition, operational design experimentation should investigate staffing models other than the current American military paradigm to integrate design. Other models worth considering might include the German General Staff Model. This model included two unique features foreign to American military thinking that might be useful; a chief of staff that doctrinally is obligated to be active in the commander's decision-making process and a robust cadre of specifically trained staff officers at every level of command.⁵¹ The chief of staff may serve as the lead operational design architect and the professional staff cadre as the core of the architecting team. This concept is simply a suggestion and the need for new staffing models would require extensive research that is outside the scope of this paper.

Conclusion

The MCPP is firmly rooted in the USMC planning doctrine that is product focused and essentially expects the commander to perform all conceptual planning. The latest revision of the MCPP attempts to rectify this deficiency by incorporating operational design in a limited fashion. This leads to a planning process that is clumsy and misunderstood. However, the MCPP is in the same state as most joint doctrine concerning operational design. JP 3-0 and JP 5-0 do not present operational design as a methodology intended to frame the commander's understanding of a complex situation but parses the elements of operational design into different functional areas. Only the CJOC and the JFWC Doctrine Pamphlet 10 present a solid introduction of operational design and its place in the current operational environment. However, no documents guide the warfighter on how to design military operations. Systems architecting is one tool, useful for bridging the gap from theory to action. Systems architecting clearly defines the purpose, methodology and role and responsibilities of those designing, building and executing military campaigns. Future experimentation should focus on the methodology and staff required to integrate operational design into current military organizations. Experiments need to identify an easily understood methodology and the staff required to implement operational design effectively. This would provide an easily understood vernacular and greatly assist in moving operational design into the forefront of military operations.

Appendix A.1: Figure 1



BOLD TEXT INDICATES MINIMUM REQUIREMENTS

Figure 1: Mission Analysis Graphic from U.S. Marine Corps Combat Develop Command. Marine Corps Warfighting Publication 5-1, Marine Corps Planning Process. Quantico, VA, January 5, 2000., pg 2-1.

Appendix A.2: Figure 2

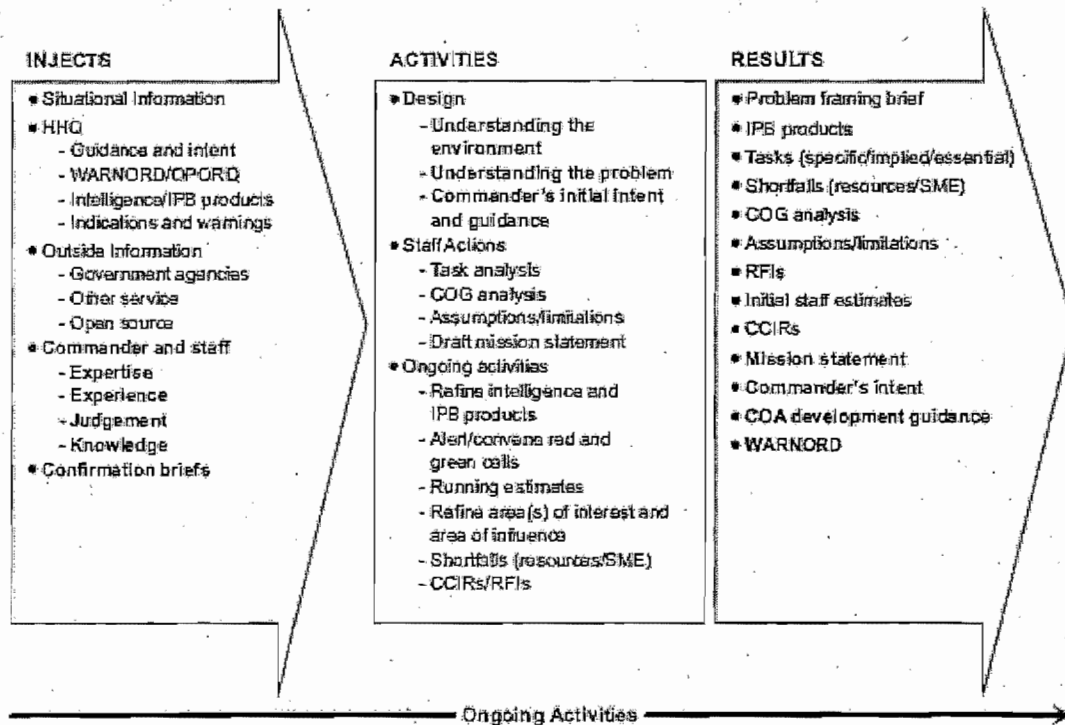


Figure D-1. Injects, Activities, and Results Diagram for Problem Framing.

Figure 2: Problem Framing Graphic from U.S. Marine Corps Combat Develop Command. Marine Corps Warfighting Publication 5-1, Marine Corps Planning Process. Quantico, VA, August 24, 2010, pg D-1.

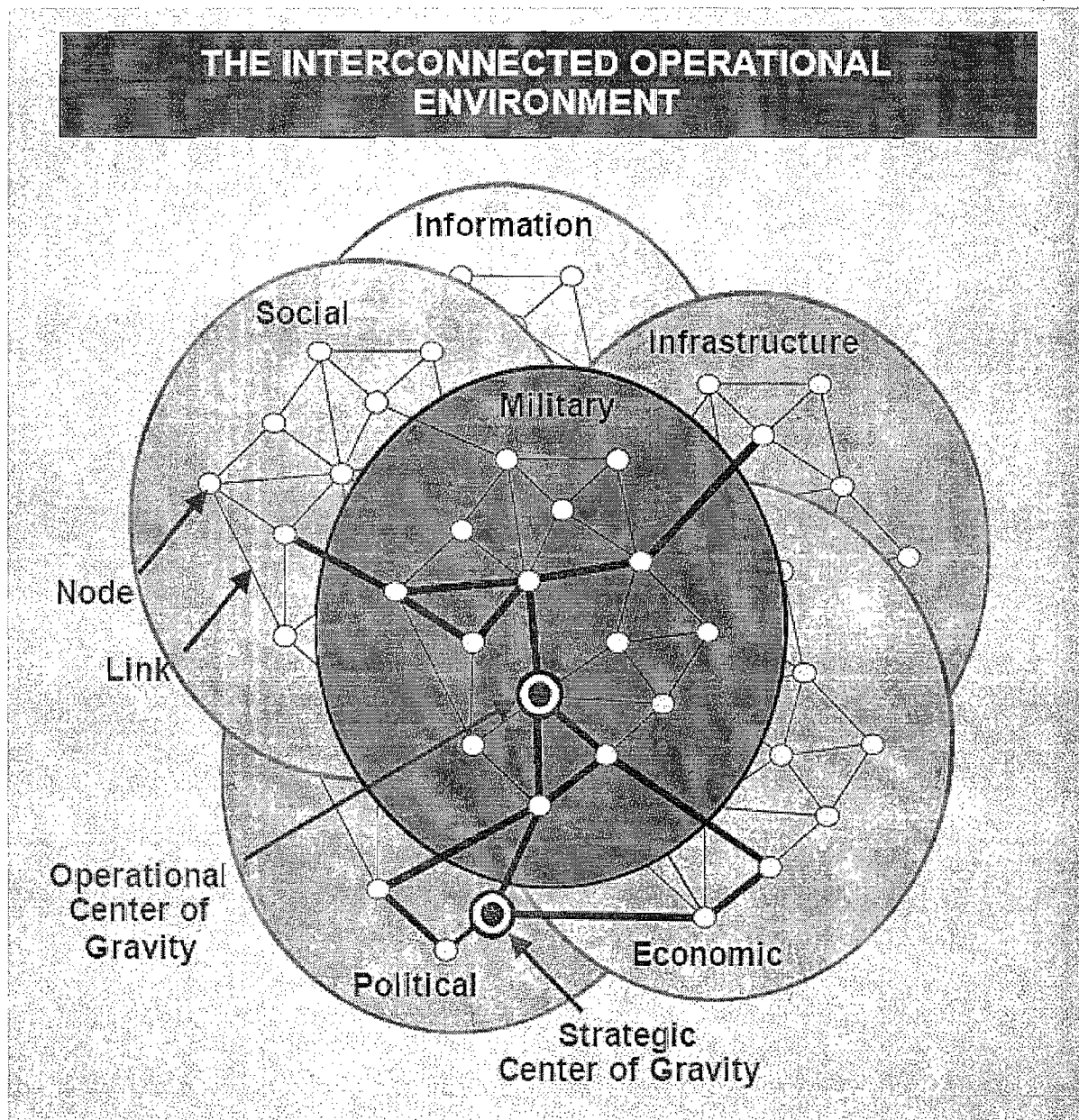


Figure IV-2. The Interconnected Operational Environment

Figure 3: Systems Perspective of the Operational Environment, Joint Publication 3-0. *Joint Operations*. September 17, 2006, Incorporating Change 2 March 22, 2010. pg. IV-4

** Similar to JP 5-0 pg. III-17

Appendix A.4: Figure 4

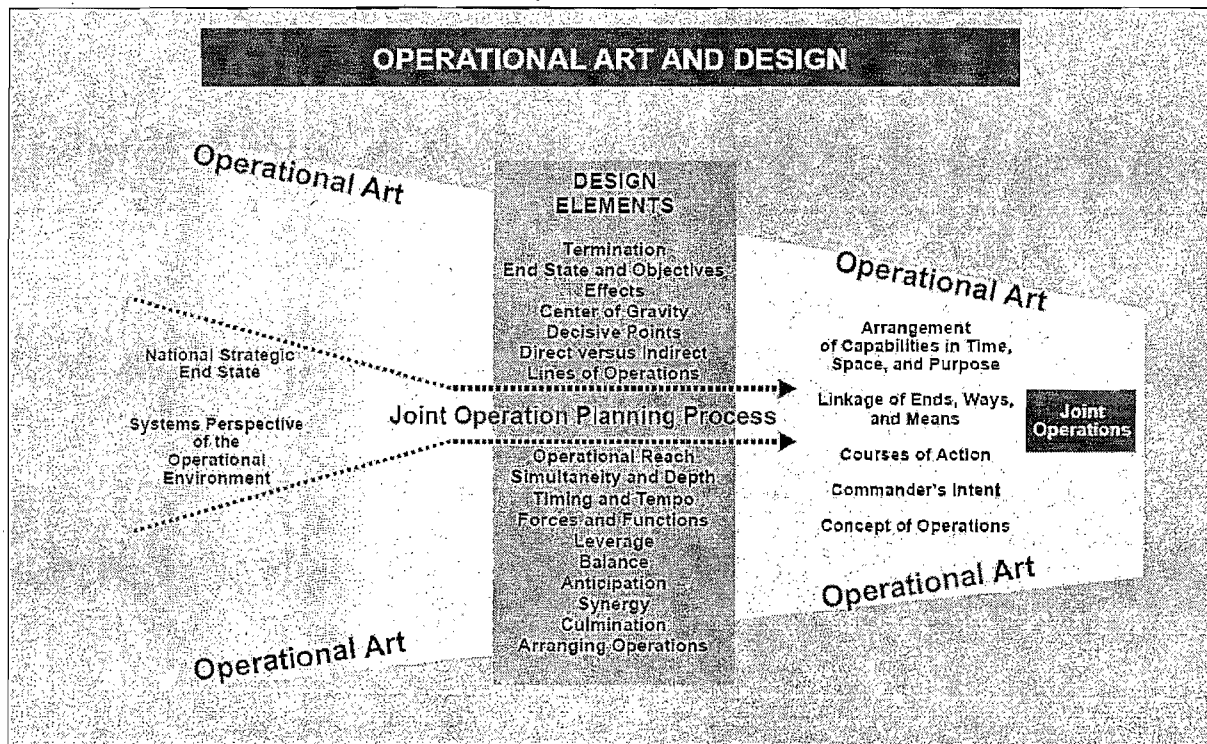


Figure IV-3. Operational Art and Design

Figure 4: Operational Art and Design. Joint Publication 3-0. *Joint Operations*. September 17, 2006, Incorporating Change 2 March 22, 2010, pg. IV-6.

** Similar to JP 5-0 pg. IV-5

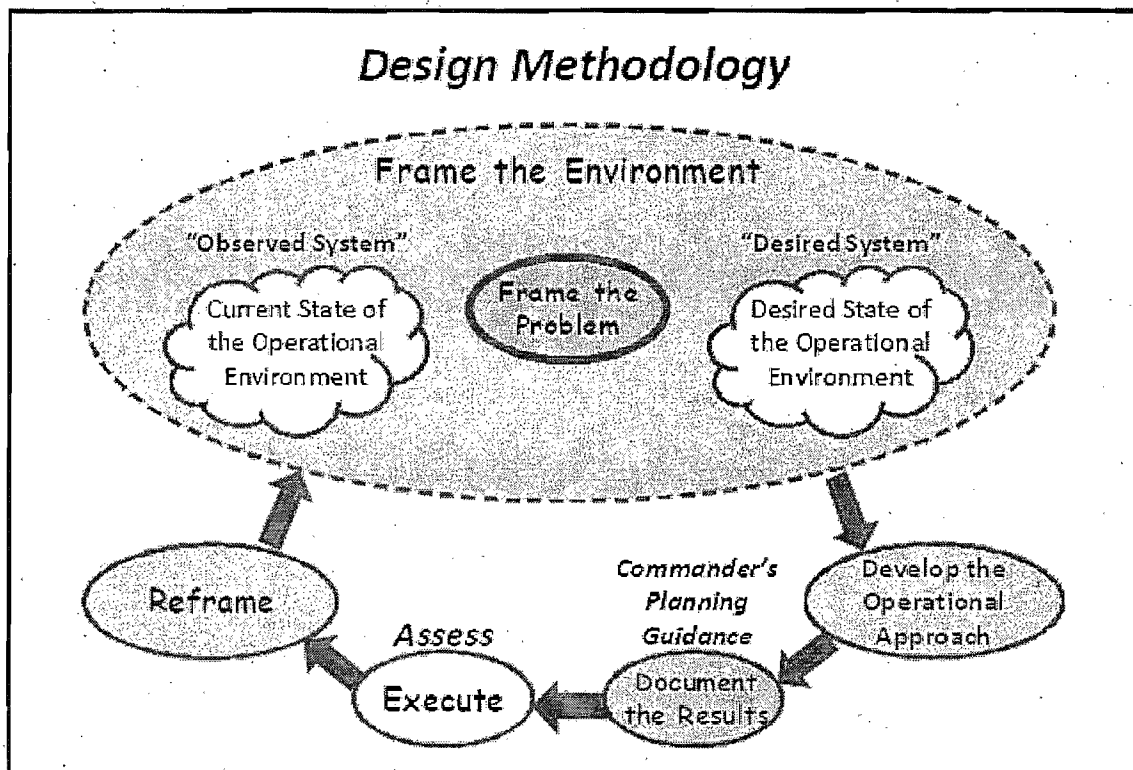


Figure 1. Design Methodology

Appendix A.5: Figure 5

Figure 5: U.S. Joint Forces Command. *Design in Military Operations: A Primer for Joint Warfighters*. Norfolk, VA, 20 September 2010. page 5.

ENDNOTES

- ¹ Marine Corps Combat Develop Command. Marine Corps Warfighting Publication (MCWP) 5-1, Marine Corps Planning Process (MCP). (Quantico, VA, August 24, 2010), Foreword.
- ² MCWP 5-1 (August 24, 2010), Foreword.
- ³ John C. Berry. "Synopsis of the Marine Corps Doctrinal Publications." *Thoughts On The Operational Art*. (US Marine Corps Combat Develop Command, 7-17. Quantico, VA 2006), pg 7.
- ⁴ Headquarters U.S. Marine Corps. *Planning*. MCDP 5. Washington, DC: Headquarters U.S. Marine Corps, July 21, 1997), Foreword.
- ⁵ Planning, MCDP-5, Foreword.
- ⁶ Planning, MCDP-5, Foreword.
- ⁷ Planning, MCDP-5, pg 34.
- ⁸ Planning, MCDP 5, pg 35-38.
- ⁹ Planning, MCDP-5, pg 91.
- ¹⁰ Marine Corps Combat Develop Command. Marine Corps Warfighting Publication (MCWP) 5-1, Marine Corps Planning Process (MCP). (Quantico, VA, January 5, 2000), pg. 1-1.
- ¹¹ MCWP 5-1 (January 5, 2000), pg 1-2 to 1-3.
- ¹² John F. Schmitt. *A Systemic Concept for Operational Design*. Marine Corps Combat Development Command, Concepts and Plans Division, Marine Corps Warfighting Lab concept paper, (August 2006): pg 13.
http://www.au.af.mil/au/awc/awcgate/usmc/mcwl_schmitt_op_design.pdf.
- ¹³ MCWP 5-1 (January 4, 2000), pg 1-3.
- ¹⁴ MCWP 5-1 (January 4, 2000), pg 2-2.
- ¹⁵ MCWP 5-1 (January 4, 2000), pg 2-4.
- ¹⁶ MCWP 5-1 (January 4, 2000), pg D-3.
- ¹⁷ MCWP 5-1 (August 24, 2010), pg 1-1.
- ¹⁸ MCWP 5-1 (August 24, 2010), pg 1-3.
- ¹⁹ MCWP 5-1 (August 24, 2010), pg 1-3.

²⁰ U.S. Joint Forces Command. *Design in Military Operations: A Primer for Joint Warfighters*. (Norfolk, VA, 20 September 2010), pg 4.

²¹ MCWP 5-1 (August 24, 2010), pg 2-2.

²² MCWP 5-1 (August 24, 2010), pg 2-2.

²³ MCWP 5-1 (August 24, 2010) pg 2-3.

²⁴ MCWP 5-1 (August 24, 2010), pg 2-4.

²⁵ MCWP 5-1 (August 24, 2010) pg 2-8.

²⁶ Joint Publication 3-0. *Joint Operations*. September 17, 2006, Incorporating Change 2 March 22, 2010), pg IV-3.

²⁷ Joint Publication 1-02. *Department of Defense Dictionary of Military and Associated Terms*. (November 8, 2010), pg 269.

²⁸ Headquarters U.S. Marine Corps. *Warfighting*. MCDP-1. Washington, DC. Headquarters U.S. Marine Corps, (June 29, 1997), pg 30.

²⁹ Shimon Naveh, *In Pursuit of Military Excellence. The Evolution of Operational Theory* (Portland, OR: Frank Cass, 1997), 1.

³⁰ Naveh, 10-11.

³¹ Naveh, 11-12.

³² Naveh, 3.

³³ Ludwig von Bertalanffy, *General System Theory*. (New York: George Braziller, 1968), 14.

³⁴ JP 1-02, 356.

³⁵ Bertalanffy, xx.

³⁶ Bertalanffy, xix.

³⁷ Bertalanffy, xvii.

³⁸ Merriam-Webster Online, s.v. "ontology." <http://www.merriam-webster.com/dictionary/ontology> (accessed January 29, 2011).

³⁹ Merriam-Webster Online, s.v. "epistemology." <http://www.merriam-webster.com/dictionary/epistemology?show=0&t=1295806307> (accessed January 9, 2011).

⁴⁰ Bertalanffy, xxi-xxiii

⁴¹ Paul K. Van Riper, "Introduction to System Theory" (lecture, Marine Corps University, Quantico, VA, January 18, 2011).

⁴² Joint Publication 5-0. *Joint Operational Planning*. (December 26, 2006), pg IV-2.

⁴³ Joint Publication. *Capstone Concept for Joint Operations*. Version 3.0. (January 15, 2009), pg 12.

⁴⁴ Schmidt, 8.

⁴⁵ Mark.W. Maier, and Rechtin, Eberhardt Recthin. *The Art of Systems Architecting*, 2nd ed. (Washington D.C.: CRC Press, 2002), Preface pg 2.

⁴⁶ Maier, Rechtin, 8.

⁴⁷ Maier, Rechtin, 12.

⁴⁸ Schimdt, 11.

⁴⁹ Maier, Rechtin. 17.

⁵⁰ Van Riper, January 18, 2011.

⁵¹ Oberst i.G Christian O.E. Milotat. *Understanding the Prussian-German General Staff*. (Carlisle, PA. Strategic Studies Institute, U.S. Army War College, 1992), pg 20.

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